

Patent claims

1. An ultrasonic standing-wave atomizer arrangement
(10, 20) for producing a paint spray mist for
5 painting a workpiece, with a sonotrode (12, 22),
with a component (14, 24) arranged lying opposite
the sonotrode (12, 22), a standing ultrasonic field
being formed in the intermediate space between the
at least one sonotrode (12, 22) and the component
10 (14, 24) in the case of operation, and also with at
least one nozzle-shaped paint feeding device (18),
which is arranged perpendicularly in relation to
the center axis of the sonotrode (12, 22) and
introduces the paint into the intermediate space
15 for the atomizing process at at least one paint
discharge point, characterized in that the
component arranged lying opposite the sonotrode
(22) is a coaxially aligned reflector (24), in that
the end face (26) of the latter, facing the
20 sonotrode (22), has a step-shaped recessed
formation (28) and in that the depth of the
recessed formation (28) corresponds to a multiple
of half the wavelength λ of the sonic vibrations in
air that are produced in the sonotrode (22).
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2. The ultrasonic standing-wave atomizer arrangement
as claimed in claim 1, characterized in that the
reflector (24) is formed as a passive reflector.
- 30 3. The ultrasonic standing-wave atomizer arrangement
as claimed in claim 2, characterized in that the
reflector (24) is formed as a circular disk-shaped
plate or as a rectangular plate.
- 35 4. The ultrasonic standing-wave atomizer arrangement
as claimed in claim 3, characterized in that the
thickness of the reflector (24) likewise

corresponds to a multiple of half the wavelength of the sonic vibrations produced in the sonotrode.

- 5 5. The ultrasonic standing-wave atomizer arrangement as claimed in claim 3 or 4, characterized in that the thickness of the reflector is at least 10 mm.
- 10 6. The ultrasonic standing-wave atomizer arrangement as claimed in one of claims 1 to 5, characterized in that the step-shaped recessed formation (28) in the reflector (24) is formed in the latter below the horizontal center axis of the reflector (24).
- 15 7. The ultrasonic standing-wave atomizer arrangement (10) as claimed in claim 6, characterized in that the step-shaped recessed formation (28) in the reflector (24) is formed in the end face of the reflector (24) lying opposite the sonotrode (22) in the form of a semicircle.
- 20 8. The ultrasonic standing-wave atomizer arrangement (10) as claimed in claim 6, characterized in that the stepped-shaped recessed formation (28) in the reflector (24) is formed in the end face of the reflector (24) lying opposite the sonotrode in the manner of a sector, with an opening widening symmetrically in the spraying direction.
- 25 9. The ultrasonic standing-wave atomizer arrangement (10) as claimed in claim 8, characterized in that the sector-like stepped-shaped recessed formation (28) in the end face of the reflector (24) has an angle of opening α of $45^\circ < \alpha < 180^\circ$.
- 30 10. The ultrasonic standing-wave atomizer arrangement (10) as claimed in claim 9, characterized in that the sector-like step-shaped recessed formation (28)
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in the end face of the reflector (24) has an angle of opening α of 135° .